

ABSTRACT OF THE DISCLOSURE

The present invention provides nucleic acid, vectors, viruses, and recombinant cells comprising triple-stranded structures, such as those resulting from central initiation and termination of HIV-1 reverse transcription at the center of HIV-1 linear DNA genomes. These triplex structures can act as a cis-determinant of HIV-1 DNA nuclear import, allowing infection of non-dividing target cells. In one aspect, the presence of the DNA triplex sequence in an HIV vector strongly stimulates gene transfer in hematopoietic stem cells. The invention also provides methods of using these triplex structures for making recombinant cells, as well as methods of using the recombinant cells to express proteins of interest both *in vitro* and *in vivo*.

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